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ABSTRACT

This paper summarizes 14 case studies from 13 countries commissioned by Unesco to describe the educational provisions for adults in the special context of scientific and technological development and to study a selected number of programs at greater depth. The countries chosen by Unesco are all countries with developed or developing industries, that have some tradition in offering educational programs for adults and that now try to facilitate working with new technologies by these means. The following countries contributed: Australia, Czechoslovakia, Federal Republic of Germany, German Democratic Republic, Ireland, New Zealand, Poland, Republic of Korea, Romania, the Soviet Union, Sri Lanka, Sweden, and Thailand, along with the European Bureau of Adult Education, which provided input from nine additional European countries. The summary provides information and examples from the various countries in terms of the following: (1) background of the new forms of adult education; (2) the functions of adult education in societies with developed or developing industries; (3) the participants; (4) the different forms and methods; (5) content of adult programs; (6) the adult teachers and their training; (7) responsibility and costs; (8) structures; and (9) future needs. The paper concludes that despite the diversity in approaches and structures among the countries, one tendency can be distinguished: adult education is becoming increasingly important and no longer represents a second-chance education for adults or a copy of the educational system for youth, but is forming a new, unique system of education. (KC)

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EDUCATION AND TRAINING OF ADULTS IN THE CONTEXT OF SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT

- A Summary -

Marit Ohayon-Kaczmarek

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
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Introduction 1

Background of the new forms of adult education 3

The functions of adult education in societies with developed or developing industries 6

The participants 17

The different forms and methods 21

Contents 30

The adult teachers, who are they and how are they trained? 35

Responsibility and costs 42

Structures 48

Future needs 56

Conclusion 62

EDUCATION AND TRAINING OF ADULTS IN THE CONTEXT OF SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT

INTRODUCTION

This paper is a summary of fourteen case-studies. In 1987, Unesco invited a number of countries to give an account of their educational provisions for adults in the special context of scientific and technological development and to study a selected number of programmes at greater depth. The countries chosen by Unesco are all countries with developed or developing industries, with some tradition in offering educational programmes for adults and who now try to facilitate the working with new technologies by these means.

The following countries contributed:

Australia	Republic of Korea
Czechoslovakia	Romania
Federal Republic of Germany	Soviet Union
German Democratic Republic	Sri Lanka
Ireland	Sweden
New Zealand	Thailand
Poland	

The European Bureau of Adult Education (1) also presented

(1) The European Bureau of Adult Education is a non-governmental organization which acts as a platform for organizations in the field of adult and continuing education. Its membership comprises the national co-ordinating bodies for adult education.

a study, with contributions from:

Belgium	Norway
Denmark	Spain
Federal Republic of Germany	Switzerland
France	The Netherlands
Italy	United Kingdom.

Special attention has been paid to the combined action of general education for adults and technical education to prepare people for changes in employment due to the development of science and technology.

Although every country has its own economic, social and cultural conditions, comparison is expected to be fruitful.

BACKGROUND OF THE NEW FORMS OF ADULT EDUCATION

The growing influence of science and technology has important consequences for educational systems. The rapid changes it causes, diminish the effectiveness of the formal education system for youth. In times that societies were more static, in many countries learning was thought to be primarily an activity for young people and education was expected to supply them with all the knowledge and skills necessary for the rest of their lives.

But this idea is no longer valid. Facts learned in youth have become insufficient and skills learned in youth have become outmoded by new technologies. Gaps between schools and the world of work are inevitable. Sometimes the speed at which qualifications lose their value is increasing at such a rate that even short breaks from work lead to a devaluation of the qualifications.

Alvin Toffler (1) describes the recent crisis as a 'crisis of restructure': the breakdown of the old second wave industrial era economy and the emergence of a new Third Wave that operates on entirely different principles, different products, different people, different structures and a different style and culture. While Second Wave industries used brute force technologies, Third Wave industries need human mental power.

(1) Alvin Toffler, "The Third Wave", William Collins Sons and Co Ltd 1980,"Previews and Premises", Pan Books Ltd 1984.

Whole sectors of the traditional economy disappear and the demand of former skilled jobs decreases. Occupations become more and more complex. Employers place increasing emphasis on efficiency and productivity. They ask their workers to be flexible and mobile and to have the readiness to update themselves from time to time. Toffler describes the 'new worker' as somebody who has to be creative, a lateral thinker, a communicator, more resourceful and independent with specialized skills and knowledge.

It is clear that the educational system has to undergo enormous changed if it wants to respond to these new demands. Increasingly the lacks of the traditionnal schoolsystem are compensated by educational provisions for adults.

Without exception, the studies mention the introduction of new technology as the principal condition for national progress. Science and technology don't have the same impact on all the countries, but in the FRG for example it is expected that about 70% of all those in employment will be directly affected by the use of information technology by approximately 1990. Nevertheless, also in countries with a large agricultural employment, where traditionally science and technology didn't play an important role, revolutionary changes are expected.

Countries have various motivations to opt for development of adult education. The countries with a capitalistic system unanimously name the growing unemployment as the

main reason for the increasing number of educational programmes for adults. In the FRG for example, trends are continuing towards longer phases of unemployment or repeated unemployment. Experts speak of the trend towards a 'two-thirds' society with the danger that large groups of the population will be excluded from the official life of society.

Socialist countries also mention important structural changes as the cause of the development of the educational system for adults. The study of the GDR states that about 2% of the labour force in industry are changing their jobs annually.

THE FUNCTIONS OF ADULT EDUCATION IN SOCIETIES WITH DEVELOPED OR DEVELOPING INDUSTRIES

The adult education programmes that are developed the last few decades in response to the growing influence of science and technology fulfil different functions.

First of all these programmes are meant to provide adults with the necessary vocational training in order to give them the possibility to keep up with the changes that occur in occupational life.

But science and technology haven't only altered working life; social, cultural and personal life are also transformed fundamentally. Thus all the studies underline the necessity of a general education component in the vocational programmes. The content and the extent of this general component depend on many different factors. The cultural and historical background of each country play an important part, as well as the parties concerned who define the functions of adult education.

The parties concerned are the state, the employers and the participants. Sometimes these parties formulate the same or complementary functions for adult education, but it also happens that their interests are contradictory.

Functions of adult education defined by the state

All states are interested in adult education as an instru-

ment to respond to changed work requirements and as a way to stimulate their citizens to contribute to economic progress. Further expectations of adult education strongly depend on historical, cultural and political factors.

Western countries emphasize the utilitarian side of vocational training for adults. Adult education has in the first place a regulating function between the output of schools and colleges and the demands of industry. Even if adult education is fulfilling this restricted function, it can't be limited to technical training, in the sense of learning new working operations, but should allow the complex development of personality qualities. People are required to be capable of performing an increasingly complicated occupational role, of working in new structures, to be able to change and to operate in a more independent and responsible way. A vocation can therefore be formulated as a complex of knowledge, abilities, skills, habits and behaviour.

The fact that for a long time already adult education is considered a profitable instrument for those who aim at economical progress, can be illustrated by the following example: in 1851 the British Parliament undertook a research that found that literate women had substantially, by about onethird, higher productivity than illiterate ones. More recent researches state as well that people with more general education are better workers, adapt better to new learning situations and are less resistant to change.

Though nowadays illiteracy exists less often in industrialized countries, another form of illiteracy has appeared: 'computer illiteracy'.

So more and more often workers will be demanded to have a good general education, a broad specialist basic education, a basic training in information technology, social competence and so-called key qualifications: ability to think abstractly, creatively and in a problem-solving way and to make quick decisions.

All industrialized states have to contend with the negative outcomes of the growing use of the findings of technology and science. The acceleration of scientific and technological progress also represent new threats to civilisation: ecological and nuclear.

A basic knowledge of science is becoming not only indispensable in the working-sphere, but in all spheres, from health to environment conservation.

Since technology is becoming more complex, the possibilities and the dangers of wrong action increase as well. The following example, cited at an expert meeting (1), illustrates this: a responsible figure of Soviet nuclear power engineering told the Pravda newspaper that some workers

(1) The International Consultative Meeting of Experts on Improving Continuing Education of Workers held in Liblice near Prague from May 18 - 22, 1987.

of the Chernobyl nuclear plant acted just as they would have in a hydroelectric power station - where their action would have caused only a not very serious breakdown. The Challenger disaster was also largely due to reliance on fool-proof technology.

From this point of view, an important function of adult education is to create responsibility and reliability.

Another function of the general aspect of adult education is the personal development of workers. In western states this aspect of education for adults receives more importance since unemployment represents serious problems in society. Unemployment represents financial costs in the form of social welfare benefits and social costs: a stigma is attached to being unemployed, which can lead to mental and physical problems and to agression.

Sometimes adult education also has a political function. Adult education is used to promote international understanding, peace and democracy.

In socialist countries the same kind of expectations of adult education are to be found, but the political function of adult education plays a more important part. Here adult education is not restricted to its functions of adaptation and compensation but is an integral part of the educational system.

Because adult education forms part of a system of per-

manent education, aiming at the building of socialist society and revolution, it's difficult to isolate its functions from those of youth education. Adult education is seen as one of the most important elements to stimulate social, cultural and economic development of the country and has a much wider educational purpose: the goal is to mould a multilaterally developed human being, a new kind of man who is capable of integrating the values of science and culture, of technical civilisation and humanism, of advanced national thinking and of socialist ethics.

Workers should not only possess the required knowledge and skills, but they also ought to consider the technological changes necessary and be determined to work in a new way. Individual needs should blend into social needs. The study of the Soviet Union states that the aim of their educational system is to gradually transform labour into the first vital necessity of each soviet person.

The Romanian study expresses the hope that adult education - in a further stage - can contribute to a participation in cultural and technico-scientific creation. A close co-operation of intellectuals and the large masses of working people should enable the masses to play an increasing role in the creation and socialization of cultural, artistic and scientific values, to participate in the conscious building of their own destiny, thus leaving behind the traditional division of culture 'creators' and 'consumers'.

Education for adults should contribute to peace, tolerance and solidarity, understanding and respect for the diversity of traditions and cultures.

The GDR mentions that there are educational provisions for adults who, due to medical reasons, have to change vocation.

A group of countries that attach a different value to adult education is formed by the countries where industrialization is introduced only recently. Countries like Thailand and Sri Lanka have a strong rural tradition and industrialization brings a completely new way of life. Thailand considers vocational training as the major means for the development of the people and the country.

Adult education is seen as a way to transfer modern knowledge and know-how to the rural sector and to prepare people to participate in the social and economic transformation of the rural environment. It should enhance positive attitudes towards work and inculcate scientific attitudes.

As an example we would like to give some of the functions of the training in rural technology formulated by the study of Sri Lanka:

- to minimize the drainage of village resources, money and manpower to the cities, and to create a more self-reliant and diversified village economy.
- to train people in skills needed for self-employment or for work on a co-operative basis, while remaining in rural communities.

- to present the art of traditional technology and local raw materials wherever appropriate in order to preserve traditional skills that are 'dying'.

Functions of adult education formulated by the employers

The interests of the state and the employers are sometimes inseparable, especially in socialist countries. In capitalist countries, governments are very attentive to the needs of industry and many times these needs are decisive for the development of educational programmes. This means that in times of economic crisis the tendency exists to restrict training programmes to the vocational elements and to cut out components leading to a more general education. In order to make vocational training conform to the demand, employers are inclined to opt for short-term projects only, which often results in a one-sided further training focused on technology. Trade unions warn against this tendency.

The interests of the participants

In the context of scientific and technological development, the first function education presents to adults is to provide them with the vocational background to allow them to safeguard their employment or to re-enter the labour market.

Another possible function of adult education is to create more social justice. To this prupose many attempts have been made. In Australia for example courses are provided to

Aboriginals in order to help them to develop the skills necessary both to find employment and to manage their own affairs as individuals and as community groups. In The Netherlands also programmes exist to improve chances of people who, as a result of social and/or cultural factors, have problems in finding a job or participating in a training course.

Many studies express the confidence that adult education can fulfil this function. Socialist countries show the conviction that adult education is a way to more equality. Countries like Thailand and Sri Lanka as well consider adult education as a manner to improve the quality of life. In the study of the Republic of Korea, education in science and technology is seen as an 'equalizer' between the privileged and the disadvantaged.

But in western industrialized countries signs of scepticism and of criticism of the efficacy of the actual forms of adult education can be found. In Sweden, a country with a long tradtion of adult education, where many efforts have been made to create the conditions to make education accessible to all adults, the gap between the educational privileged and the educational deprived has hardly diminished at all. It is found that the higher a person's formal educational level is, the more likely this person is to take part in some form of adult education.

In the FRG a qualification offensive of companies and federations has been the subject of criticisms. Since the

criticisms of this specific case are relevant to the actual situation in western industrialized countries, we would like to quote them in their entirety:

"- the objectives for the training work are derived one-sidedly from economic planning.
- the training objective of reflexivity has been neglected.
- the domination of in-company training leads to a reinforcement of inequality of opportunity (in relation to certain labour groups and specific sectors).
- the efforts to appeal particularly to the unemployed suggest a monocausal way of looking at the solution to the problem. Qualifications offensives with this stress support the general view that unemployment is a problem only of lack of qualifications.
- a development is feared that lifelong learning will become learning as a life sentence, i.e. a lifelong fear of losing competence.
- a warning is made about the development of a dichotomy in programmes in further education between training directed towards efficiency and adaptation and a broad programme of compensation and creativity."

The Belgian contribution states that the present education programmes are preparing adults for work in which they feel completely alienated. Because of this alienation, people have lost all initiative and all real responsability.

In the light of these signals, that current adult education programmes don't supply the real wants of adults, adult education can respond in two ways:

a) Adult education can assume the function of a support for people who are facing problems due to the changes in the labour market. In this case, next to the occupational skills the so-called 'life skills' play an important part in the courses. These courses aim in the first place at helping the participants, in case of unemployment to feel more confident about their abilities, to come out of their isolation, to break the apathy and other effects of unemployment and to find meaning in a life without work. In case of changes in employment the participants learn how to cope with the stress and fatigue these changes can cause. In both cases adult education can contribute to a better understanding and thus a possible strengthening of participants' position in society by giving them more insight into the working of society.

b) The other response of adult education is to make an effort to create more human working conditions by providing adults with skills that enable them to work in an alternative way.

Many times this results in stimulating efforts to establish new, small businesses at local level. In France for example a project exists that aims at teaching farmers other methods of production. The French contribution states that modernization has reduced the occupation of farmer to being a provider of raw materials for the food-processing sector. The farmer is transformed into a worker whose working conditions are dictated by industry. He finds him-

self affected by every variation in price. And all the present educational systems are designed to integrate the farmer into the economic system through a single channel. Young people are taught to think in a macro-economic way; they have to know how prices are fixed.

The new project has been set up with the purpose to give the occupation of farmer a new content: a farmer should be an 'exploitant rural', working in a small-scale farm. His work should be centred on the local environment and based on the search for autonomy. This implies that farmers should get a simple training in management, accountancy, self-help in maintenance and repair.

In Belgium as well efforts exist to give work another content. Recycling plays an important part in these initiatives that aim to create the following effect: "give back man the ability to free himself from the chains of 'de-responsibility' and to open the cage of dehumanization and become capable of recreating work."

These examples show, that for the participants very important functions fo adult education are: to get control over events and to develop independence and creativity.

THE PARTICIPANTS

The variety of the people that take part in a form of adult education is enormous. Each targetgroup is different and this has important implications for the way the educational programmes are designed, since the programmes are effective only when they take into account those differences.

Once more the political system is decisive.

Socialist society starts from the principle that the educational system meets the needs of the whole society. According to this principle there are no neglected groups, which means that adult education programmes aim in the first place at updating and developing skills of the working part of society; workers, employees, farmers and specialists.

In socialist countries the number of people invòlved in a form of adult education is large. In the Soviet Union in the 1980's more than one third of all workers, employees and farmers upgraded their skills annually. In this country special attention has been given to the training of specialists and workers of high skill.

The study of the GDR mentions special programmes in order to train semi-skilled workers as skilled workers and programmes to re-integrate mothers into the process of work.

The majority of the Polish adult students are in their early twenties, or about fifty years old. A special targetgroup is formed by people of the 'third age', retired people who are still active in different fields of social life.

In countries with a capitalist system, adult education programmes are mainly destined for social groups that are liable to be the victims of the economic crisis.

The most important group is formed by young people. Unemployment among young adults is high, while a large number of young people is leaving school with no formal qualification. New Zealand is mentioning a number of 33%. In nearly all the countries of the European Community the number of young unemployed has increased enormously since the beginning of the 80's. Often what they have learned in school does not make them fit for any of the jobs available in the labour market. Many young schoolleavers never get the experience of training on the job. In France, where an ever increasing number of young people leave school at 16, either without qualifications or with qualifications unacceptable in the real world of work, industrial managers are increasingly employing young people with a 'Bac' (youngsters who passed the final examination of secondary school), even if their education does not correspond to the needs of the job, but they hope that they will adapt more easily to new situations.

Another important targetgroup are women. Generally they have had less education than men and need more often, during adult years, to make up for a deficient basic education. For many women adult education means the first step into the employment sector. Other women need educational support when they return to work after bringing up children.

Immigrants and refugees often need language-courses or general courses that inform them about the country that received them, in order to be able to take part in working life.

Other special groups are the illiterate, people with reading and writing disabilities, and the handicapped.

Interesting is a Swedish report, made in 1985, that shows which people took part in the heavy expansion of Swedish adult education and which people were left out.

As we have seen already, this expansion has not led to more equality:

- just over 20% of people with at the most nine years' education behind them participated
- more than 40% of people with some form of upper secondary schooling participated
- more than 60% of people with post-secondary education participated.

Further the majority of participants in trade union education are manual workers. Study circles and employment training recruit a larger proportion of the educationally deprived than other forms of adult education. Generally speaking, adult education is more common in the big cities than in rural areas. Women have a higher adult education rate than men. Adult education is more widespread among the employed population than among those who are unemployed or for other reasons not economically active. Many of these people have unhappy memories of their childhood schooling

and do not wish to repeat their failures.

Insofar as under-educated and initially poorly motivated groups have been recruited for educational activities, this has normally been achieved through some form of outreaching activity; union educational organisers visit people at work and persuade them, for example, to join a trade union study circle or a short course, which often proves to be the gateway to further studies.

In Thailand, one of the countries with developing industry, the majority of the participants live in rural and outskirt areas. Many of them are young unemployed.

The target population in Sri Lanka is relatively young as well.

THE DIFFERENT FORMS AND METHODS

Because adult education has to compensate the shortcomings of the formal education system for youth and to respond to changes due to the progress in science and technology, inventiveness and flexibility are important properties of the educational activities for adults. This has resulted in a wide variety of forms and methods.

First of all there is the difference between in-school and out-of-school forms (formal and non-formal forms).

In-school or formal forms provide adults with education carried on inside the formal school and higher education system. Many countries offer adults the possibility to complete primary school or secondary school education. This in-school education can be given in the form of full-time, part-time or evening classes. Sometimes, like in New Zealand, schools offer places to adults who wish to return to dayschool.

Primary school education or a form of secondary school education might be a requirement for adults who want to take part in some form of vocational training.

Some countries offer basic courses or pre-vocational programmes before continuing vocational education. In Italy, in an educational project, basic education has been combined with vocational training. The course was intended for workers of 'Italtel' with such limited schooling that it would be impossible for them to grasp the basic rudi-

ments of electronics. It consisted of 350 to 400 hours of basic education - history, Italian, mathematics and physics - and 100 to 150 hours of vocational training devoted to electronics.

Vocational education can be part of the formal educational system. There are vocational schools leading to qualifications. But very often vocational education is given in the form of courses: long or short-term courses, courses leading to a qualification, courses specializing a small targetgroup or informing a large number of people, like the agricultural and zootechnic mass courses in the Romanian villages destined to enable the population to keep abreast of the revolutionary transformations in agriculture.

Often these courses take place in an adult education centre. This might be an existing centre, also offering other activities, like a cultural institute, a folk university, a youth/village development centre, a club, a trade union centre, a museum, a library or a conventional school. There are also centres specially made for adult education, like the Australian skill centres, the special centres for new technologies in Belgium or the specialized training and improvement institutions in Romania. Many efforts have already been undertaken around the world to move towards multi-purpose learning centres serving different needs for different groups in the community.

These forms of training, the so-called 'off-the-job

training', are usually only part of the whole training programme, often they are combined with 'on-the-job training', which means vocational training given in the normal work situation.

Especially in the adult education programmes in the field of science and technology, experience in practice is largely emphasized. For employed adults there is often the possiblity to combine the new educational programme with their working experience. In the Soviet Union 'educational-industrial bases' are organized in enterprises for the training of workers. They include:

- educational workshops
- sectors, shops, field grounds
- individual working places
- educational facilities (laboratories, class-rooms, study-rooms).

They are equipped with the necessary machines and devices, technical means of education and educational visionary aids. In agricultural farms, kolhozs, sovhozs and other agricultural enterprises as well workers are trained directly on the job.

But also for people who don't have a job, practical experience is indispensable. In this case, the conditions of a work-situation have to be created, or the participants have to acquire their practical training in the apprenticeship system. Unpaid traineeships form another possibility.

Workshops are also a way to train people in a work

situation. An example of a workshop is the experiment in Santiago, Chile, where in some of the city's slum areas unemployed youth were fully trained on the job for some months in informal sector workshops. Local craftsmen were invited to train the youth in trades for which job openings were available or in which self-managed production units could be established. Theoretical training was to be provided to the extent necessary to produce an acceptable product according to the regular standards of quality.

In the FRG, unemployed have participated in professional project work. This form has been created because most of the unemployed were found places in small and medium-sized firms where a new type of skilled worker is emerging. Here the organizational division between production and service no longer exists so that planning, production, sales and service are often carried out in a team as a joint task. The demands resulting from this can only be carried out by skilled workers who have a broad basic knowledge and the corresponding qualifications covering several fields of work. The aim of these projects was that a product would be marketed competitively after a pilot phase. The participants would work together as a group. After a long discussion phase, the following project ideas were selected by the participants and taken up:

- the building of a wind-power plant
- the building of an air-water heat pump with construction and installation

- the building of a plant using thermal power for heat and power production.

The planning and carrying out of the individual projects was the sole responsibility of the participants as a group. The teachers in the project were only responsible for counselling and decisions within the team on the teaching of theory and practice.

Communication between the individual projects took place in a weekly project plenum in which individual participants presented their project work and reported their progress or their difficulties in the various phases.

There is a world of difference between working in projects and learning in a traditional western school, based on the principle of individual performance and competition. The participants must be willing to develop new ways of learning and working in groups.

Another form of alternative education in the FRG is the subject-oriented learning and working project for the unemployed. This project can't be dissociated from the social reality in West-European society; for many unemployed finding a job will stay an illusion, and still they will have to try to lead a meaningful life in a society still based on estimation for work and money earned by working.

This project is based on the subjective learning needs of the participants, putting the acquisition of objective qualifications second place. The notion of work in the title of the project does not mean work only in the usual

sense of employment. Learning and working form one unit in the project. The participants, who didn't see their unemployment as something 'terrible' or as some sort of 'fate', but as a chance of gaining new experience, decided together to create a joint centre. A former factory was rented and workshops were set up for pottery, leather, bicycle repairs and the fitting out of buses and small lorries as caravans. A café and a shopping centre were also set up.

In many other studies new methods are mentioned where collectively developed training, learner centredness and experiental learning (learning by doing) play an important part. These new methods are more likely to produce qualities of initiative and autonomy, they allow the participants to take an active part in grasping the new technologies.

Other methods are the problem-solving method, the games method and simulation.

New Zealand and The Netherlands mention experiments where an individual plan of training is drawn up for each participant, according to knowledge and skills.

And in Thailand the importance of the open classroom concept is emphasized. The students, adults with working and other obligations, should be able to come in at any time of their convenience.

Lectures, discussion groups, study circles, seminars and conferences are other forms of adult education.

The study circle is a group of people meeting regularly for the co-operative study of a subject or problem. A study

circle does not have a teacher with specialized knowledge of the subject or porblem, but may have a leader trained in techniques of group leadership. In Norway study circles have formed the basis for local job-creation activities.

These groups offer the possibility to exchange experiences and express ideas on vocation, to give practical demonstrations and to discuss and analyse the present situation.

Visiting exhibitions or making a (vocational) study visit is an opportunity to obtain knowledge especially for people who don't have the possiblity to frequent a school or course.

In Thailand there are mobile vocational training programmes in order to reach people living in remote areas.

Radio and television as well are used in many countries for the education of adults. In Poland the 'Radio and Television Agricultural Secondary School' is set up in order to enable farmers to keep pace with the changes in agricultural production and to improve cultural life of people living in rural areas.

Distance education can also take the form of correspondence study. These forms of education give people the possibility to study in their own time and in their own rhythm. Newspapers, books, cinema,theatre, museums and libraries might contribute to this self-education.

The computer has also emerged as a medium for instruction. Computer-assisted learning allows the individualization of education.

As we have seen in this survey, next to the formal instruction, many non-formal provisions contribute to the education of adults. The out-of-school forms are more flexible and able to respond to changes in working life due to the progress in science and technology. Often they contribute to innovation and represent a potential value for the re-thinking process within formal education. Sometimes practices that, from the angle of western conventional education, were considered improvisation or amateurism, are now revaluated as means of education. With the new demands from the labour market: independence, flexibility and creativity, the traditional economic/cultural divide is disappearing. Leisure-time activities and professional training are becoming different means to achieve the same end.

Non-formal projects can offer many advantages: they result from local needs and might have direct utility in the local economy. Many times these projects make use of local resources and local artisans and farmers as instructors. This way costs are kept low and a certain degree of independence has been reached.

Non-formal ways of learning, however, are most of the time destined for disadvantaged groups. For this reason we should be vigilant that, in our present-day societies, these forms will not become a poor alternative to fulltime education, a poor man's substitute for an increasingly

expensive modern education, and that they will not contribute in this way to maintain the inequality of opportunities.

CONTENTS

As stated earlier, the programmes consist of different components: occupational components and personal and general education components. We have seen that the content and the extent of these personal and general components depend on historical, cultural, encomical and political factors.

Often it is difficult to define the difference between general and occupational education. Many times a certain level of general knowledge is required for the prosecution of a profession. For this reason in Poland more and more elements of ecomy are being introduced to vocational training. Workers are taught to think in terms of economy in order to save materials, energy, worktime and raw materials.

Another reason is the increasing trend towards jobs covering more than one area. In New Zealand, courses are provided to introduce students to a 'family' of occupations.

There is a large diversity in occupational programmes for adults: there are courses training in electronic and computer systems, in commercial office work and administration, etc.

In Ireland, for example, 58% of those who take part in a form of adult education, participate in work-related courses, and there is an almost even split between scientific/technical subjects (23% of all courses), and business/commercial subjects (19% of all courses).

The French contribution warns against a training exclusively directed towards the most popular areas of work; it would create a new elite in new technologies (electronics and computers). Occupational training should also respond to the needs of other sectors, like agriculture, so that they will not be turned into permanently subsidized bodies.

However, the scientific and technological progress will not devalue simple practical work knowledge and skills. Frequently vocational training is directed to more traditional trades like motor mechanism, foundry, masonry etc. Especially in a country like Sri Lanka these traditional trades play an important part in adult education. In this country, sometimes the possiblity exists to get, as part of the vocational training, an orientation in entrepreneurship: to get a basic knowledge of how to start a business, maintain accounts, compete with market forces and have transactions with banks.

In West-European countries we can also find this tendency towards a training in more simple techniques, above all in the projects that are trying to offer an alternative way of production. An example is the already mentioned - French project that tries to give the occupation of farmer a new meaning (page 15). Rather than introducing high performance techniques resulting from technical progress; stress is laid on introducing appropriate techniques. The participants are also provided with a thorough knowledge

of the ecological, economic and social potential of their surroundings.

Knowledge of ecological problems and environment protection often forms a part of occupational training. Other subjects are: health care, fire protection, hygiene and safety in order to prevent work accidents and occupational diseases.

In Poland vocational training programmes include information about the past and the future of the establishment, about the place the worker is to occupy in the whole system of production, about traditions observed within the establishment and the employer's expectations concerning the worker.

This kind of general information can go beyond the limits of the working place and take the form of civic, social and political education.

In the FRG, the 'German Adult Education Association' has declared that in future all vocational curricula will have to contribute to a broad discussion on the significance of work and employment, on the unemployment of millions of people and on the tense relationship between economy and ecology.

Another subject is the relation between technological progress and social development. In Australia, a research report dealing with information technology, strongly urged that besides the technological applications of information technology, the social implications should be taught as

part of the general education component.

Training programmes might include some form of personal education. The aim is to make participants aware of their own situation in life. In the FRG it is found that, if in training programmes for disadvantaged groups no room is left for the discussion of subjective individual problems, many participants will not continue the training. Many divorced mothers or single parents for example leave the course if only factual knowledge relevant to the job is taught and if the solution to their problems is left to them.

The workshop project for unemployed youth in Chile that we mentioned on page 24 devotes an important part of the programme to help the participants carry out an analysis of current youth problems, such as unemployment, drug abuse, sexuality, human relations, so as to better understand themselves, as well as their role in the community. This involves the organisation of small groups to collect local data on these problems and the joint interpretation of findings.

If in industrially developed countries the emphasis lays on personal development, in countries with less developed industry literacy still plays an important part. In Thailand for example, through the provision of functional literacy programmes the needs and problems will be identified and analyzed. Then the information and essential knowledge on vocation will be disseminated through learning materials and mass-media. Literacy is often a base for vocational training.

The Belgian study also underlines the importance of language: a great deal of attention is paid to language, especially to learning how to write applications for jobs, and how to hold one's own in a discussion.

Finally, adult education programmes might include some form of career guidance. In order to provide the participants information about their professional possibilities, a data system might be of use.

THE ADULT TEACHERS, WHO ARE THEY AND HOW ARE THEY TRAINED?

Not only do the forms and methods of adult education vary, but also the teaching staff shows a great diversity.

Specialists, advanced workers and team leaders can be involved in the training of workers. Often they don't have any didactic training. There are specialists who, next to their vocational knowledge received some form of educational training and people who are trained to be a full-time adult teacher.

In Poland, the head of each workers' group, usually a foreman, has the function of teacher. Management training courses conducted in enterprises, but more often in specialized centres, provide the training for the foremen. Another form of management training are the so-called 'masters clubs', where members meet and have discussions about interesting publications or about radio and television programmes, where they exchange experience obtained in their enterprises or other institutions, institutions abroad included.

In the Soviet Union, where the vocational training of workers is guided by instructors of industrial training and teachers of theoretical knowledge, the recruitment of adult instructors and teachers is executed according to a fixed scheme: the instructors are selected among the skilled workers, who have working experience in a profession of no less than 3 years, as well as high industrial achievements, general secondary or specialized secondary education. The

teachers are selected from among the managers, engineering-technical workers and specialists, who have a higher or specialized secondary education degree and working experience in a profession of no less than 3 years. The list of workers, selected for the vocational training of workers in production, is annually approved by the administration of the enterprise in consultation with the committee of the labour union. They have to learn the basics of pedagogy within the programme, approved by the State Committee of the USSR on vocational training. They can be freed by the authorities of an enterprise from their main work while securing their average salary.

In Czechoslovakia, a specialist who is chosen by his organization and who has pedagogic gifts can take a fortnight course for the instruction of workers. If he passes the examination at the end of the course successfully, he is authorized to train and examine workers.

Another type of adult teacher in Czechoslovakia is the 'lecturer'. He also works in the sphere of work-based education and training. Usually he has no special pedagogic education. The enterprise or institution takes care of the improvement of his qualification and organizes courses and training lessons, supplies study material and sends the lecturer to the courses organized by social organizations (Socialist academy, Czechslovak scientific-technical society etc.).

In Thailand, especially in remote rural areas, local

craftsmen, farmers, experts etc. are recruited to be trained as vocational instructors.

In Australia, like in many other industrialized countries, to be a vocational trainer is usually a full-time profession. It is considered a problem in Australia to find ways in which the trainers can update their technical knowledge and skills in their teaching areas. Many training colleges don't have enough links with industry to keep up-to-date. There is an urgent need to institute continuing education programmes which will bring trainers into close contact with industry and commerce.

In New Zealand major changes have taken place in the training of teachers over the last few years. In order to serve better the changing needs of polytechnics, new curricula have been drawn up. Very important is the move from voluntary to compulsory training for adult teachers. By making the training compulsory, recognition is given to the special skills required in teaching adults. In the curricula, the emphasis lays on developing the qualities required to manage rapid change. High priority is given to the skills of learning, as it is believed this is one of the keys to achieve change. The students have to discover their own learning style in order to later be able to assist their students to do the same. The students are also trained in communication and human relations. For example by developing in them an awareness and sensitivity to the value of other cultures. Videoed teaching sessions are used to assist them

to become aware of their ability to relate and listen to students. They are encouraged to look at their own response to change and to experience change no longer as anxiety provoking and something that has to be coped with, by learning the skills to accept change in a positive way.

The first special training programmes for unemployed in New Zealand were conducted through polytechnics. They soon found out that different skills and methods were required for these students. A group of teachers (most of them part-time) took the initiative to develop skills, curricula and expertise that met the needs of their students themselves. Because so many of the unemployed were Maori, Polynesian and women, understanding of Taha Maori was seen as a necessity and the issues of sexism and racism got a lot of attention.

In many other countries as well the need is felt to change and to improve adult education programmes. Sometimes teachers know almost nothing of the working environment of their students, or they have not been trained in social sciences, which might make them feel uncomfortable when discussing social issues. Often the learning is passive, requiring students to sit, to listen and to take notes. Another obstacle in adult education programmes might be the poor quality of reading materials for the students. As it happens quite often that the reading abilities of the students are not very developed, their reading materials should be clear and simple.

This desire to change entails a profound investigation

of the needs and qualities of adult students.

First of all, the need is felt almost universally by those who design the programmes for adults to conceive an adult in a different way than has been done before. It has been found necessary to lower the age of an adult to 15 (when a person is ready to leave secondary school or is mature enough to withstand the physical and mental strain at work). The treatment of young men and women as 'mature children' instead of 'young adults' is felt as a disadvantage for their entry into working life.

Because there are many circumstances that make adult education different from education for children, special attention should be paid to the andragogical training of adult teachers.

As far as the learning abilities are concerned: the ability to generalization and criticism is growing at adult age, mechanical learning abilities and the speed of certain intellectual operations are, however, decreasing.

But more important is that adults learn under different conditions than children: for many adults their main activity is their work, they have to fulfil social functions and they have obligations towards the family. Their life and work experience has formed them, which means that a group of adults is even more pluriform than a group of children.

Because groups have a heterogeneous composition and because social conditions might influence the learning process, a different approach is required. The teacher should in the

first place be a partner, an advisor, a guide. Often adults are in some fields more experienced or better informed than the teacher. The knowledge and skills already possessed by the participants should be recognized and integrated in the learning process. This will make the programme more efficient and more intersting for the participants.

For all these reasons programme makers should look for forms and methods that will allow adults to learn in an individual and independent way.

Work in projects offers these possibilities. The teacher leaves his traditional role; in the process of mutual exchange of skills and capabilities, the participant is not seen as a learner who does not know anything, but as a specialist with his own competence. The participant has a high degree of responsibility: he plays a decisive part in organizing the learning programme. Starting point is his every day life and experience. The joint identification of needs and problems and the joint development and working out of the content of the programme leads to active learning. The learning programme does not consist of isolated components of knowledge, as in the traditional occupational education, but consists of an integrated whole of specialist knowledge and specialist theory connected with the industrial, cultural and social reality. The participants work in a cooperative way. The difficulties in the course are not only the teacher's problem, but the success of the course depends on all those taking part.

It is found that even if the participants have negative school experiences, it is possible to make learning a positive experience by working in projects.

RESPONSIBILITY AND COSTS

Generally we can say that adult education is provided and financed by the state, by the employers or by others.

By far the most important provider of adult education is the state in all its forms.

The state can be directly responsible for the training and education of adults. Usually it is the Ministry of Education and Science that organizes adult education or subsidizes existing organizations. Another ministry often involved in the education of adults is the Ministry of Labour; it provides or finances training programmes and sometimes gives a wage subsidy to workers who have to be retrained. In New Zealand training programmes are funded through the Department of Labour rather than through the Department of Education. This reflects the feeling that inadequacies in the educational system are responsible for the growth of the number of unemployed youth.

Other ministries responsible for adult education are for example: the Ministry of Agriculture, of Social Welfare, of Cultural Affairs.

In countries with developing industry, the state attaches much value to vocational training of adults. This has resulted in the creation of vocational training authorities. In Thailand for example, there is a special Department of Non-Formal Education and a Department of Vocational Education. Often the government-sponsored programmes in these countries

have a better reputation than the programmes of non-governmental agencies.

Sometimes a government appoints a special commission for the management of vocational training affairs, like the 'Manpower Services Commission' in the FRG and in Belgium, or the State Industrial and Commercial Training Commissions in Australia.

Often the state is only indirectly involved in organizing and financing of adult education. In these cases the responsibility is assigned to local authority. Another possibility is a partnership of national authority with local educational authorities, universities, voluntary bodies and many others.

The indirect involvement of the state in socialist countries often takes the form of appointing industrial or agricultural enterprises and other state institutions and organizations to share the responsibility for adult education.

In Romania all economic bodies, from ministries to enterprises, hold particular tasks in the organization of vocational training. In Poland the training of workers at state enterprises is organized by the staff itself. The training is organized in centres attached to the enterprises, or in special organizations charged with the training.

The Polish State finances schools for adults as well as social organizations that carry out adult education. Enterprises are charged to cover the costs of their workers' training, both of in-school and out-of-school forms of

training. Participants in out-of-school education have to share the expense if they study on their own initiative and for their own purposes. In general, however, adult education in socialist countries is free of charge.

In Sweden also all national and municipal education is free of charge. Adult students can receive study assistance in the form of a grant proportional to previous earnings or a payment on an hourly basis to compensate the loss of earnings. Adult study assistance is financed by means of a special adult education charge levied from all employers. The number of persons receiving assistance every year depends on the revenue derived from the employers' levy. At present, less than half of all eligible applicants actually obtain assistance.

The Swedish state is responsible for the education of adults at primary and secondary school level as well as for the education of the unemployed, and contributes to the further education employers organize for their employees.

During the economic depression of the 1980's, there has been a shift of responsibilities from the state to the municipalities and to other organizations playing a role in the education of adults. The result is, that now that the subsidies of the state are reduced, protests of the public are not primarily directed against the state, but against the municipalities and other responsible organizations.

Because of the retrenchment policy, the prospects of reform have been very limited in recent years. This complaint is heard in many other western industrialized countries.

Frequently initiatives to change the actual system in the form of projects etc. can't be realized because of a lack of funding.

Since many western states are less prepared to invest in adult education, the programmes the private sector is offering adults are getting more importance.

Often industrial firms co-operate with the government and educational institutes in the field of adult education. But in many cases, industrial firms have the entire responsibility for the education of their employees. In the FRG, 47% of the adult training is carried out by industry. More and more employers consider adult education as an investment for the future and organize in-plant education for their workers.

These developments may result in the creation of a new education gap or the expansion of the gap which already exists between people in the labour force whose companies are prepared ~~prepared~~ to invest in them and people in or outside the labourforce who are not eligible for a training programme. Provisions for under-privileged groups are liable to be neglected.

If employers are the main providers of adult education, the participants lose a great deal of their free choice of education. Vocational education will be focused on a particular working place.

In the recent past, education workers agreed that the entire workers' education should be made free of charge, just like compulsory school. Now that the economic crisis is an obstacle to realize this aim, more attention is paid

to the arguments of some psychologists, that free education makes the students less responsible, less active and less interested.

In developing countries, the fear exists that with limited resources the principle of free education will lead to an almost automatic redistribution of means in favour of highly qualified and, as a rule, highly paid categories of workers, as the courses designed for them are on the average longer, require more expensive equipment and better qualified teachers. For this reason in many countries subsidies are mainly destined for programmes designed for priority groups.

Other organizations and institutions that contribute in the creation of adult education programmes are: trade unions, private institutions and schools, chambers of commerce, religious organizations, women's groups etc.

Especially trade unions often play an important role. They co-operate with the state and enterprises in order to watch over the quality of the training of their members or they themselves organized vocational training programmes.

Finally, the contributions of the participants should not be underestimated; often they support adult education programmes by paying fees. A special example is the Spanish print shop project of 'Schools for Living' in Vallecas, a working-class neighbourhood of Madrid. The printshop is financed only by the voluntary contributions of the members of the Collective. It is estimated that after at least five

years it will be turning a profit. The ultimate aim of the print shop is to make it the motor of a neighbourhood employment centre manned by youth, which will provide an alternative for other young people.

STRUCTURES

We have seen that there are many different providers of adult education, who all have their own reasons to support the education of adults. The educational mechanisms they use are as diverse as the objects they have in view. This diversity makes it difficult to discover common structures or to compare structures, even inside one country.

Many educational systems for adults emerge spontaneously, and their aim can only be formulated ad hoc. The need, however, is felt to use these spontaneous educational actions for longer-term solutions.

All the studies underline the importance of co-ordinations and co-operation, first of all on a national level, but also on an international level.

A lack of integrated structure leads to the duplication of efforts and waste of resources. Information about the possibilities in the field of adult education often does not reach the target groups and many programmes are not relevant to their needs. Without co-ordination, education-based programmes, employment-based programmes and the world of work stay closed units. In isolation developed programmes are many times insufficiently evaluated and they don't offer much comparability of training standards. Another consequence is the wide disparity in teaching abilities among those recruted as instructors.

As we have seen there are examples of co-operation at

local and national level. Sometimes national and regional government, employers, trade unions and educational institutions are partners in the creation of adult education. Sometimes there is co-operation between universities, institutes engaged in the new developments in science and technology and adult education centres. Or there is a close communication between vocational training institutes and industrial firms, as is the case in the Republic of Korea. In order to adjust the demand of the labour market to the supply of vocational training institutes, in this country statistics and job analysis are utilised.

In a Dutch experiment meant to restructure existing training courses and to make them accessible to adults lacking preliminary training, numerous partners co-operated: municipalities, Regional Employment Exchanges, district employment exchanges, vocational guidance bureaus, vocational education with or without counselling, day/evening formal education, training facilities, adult education centres, non-formal education for adults and organizations of and for women and ethnic groups.

A co-ordinator was appointed by the co-operating team to point out the responsiblity of each organization. However, this responsibility did not go beyond that part of the training programme in which the institution had definite tasks to perform. There was a so-called 'loose' form of co-operation. The co-ordinator also supplied information on developments on the employment market for the purpose of

planning appropriate training courses. Any wishes for particular occupations voiced by the targetgroups were recorded in an attempt to match the supply to the demand. After that, tutors and instructors from the various institutions designed programmes suitable for adults.

In Belgium, an experiment to improve the learning opportunities for low-qualified adults, tries to develop access possibilities from programme to programme and between parts of programmes, as well as to establish co-operation between the work of the public libraries and the broadcast media. The expectations are that the experiment will clarify the link between basic education and the labour market.

In Poland organizations of banks of curricula and teaching materials (text-books, teachers' books, study materials etc.) are founded.

In Thailand a data bank on vocation is developed, that provides information on the following items: - human resources in vocational areas - learning resources - fields of vocation - local resources - printed and non-printed materials in vocation.

If the studies don't mention some kind of effort to advance integration, they do underline the necessity of integration for the development of adult education.

For example, the advantages non-formal training might offer to the development of adult education are often not fully used because of a lack of integration. Non-formal training is often considered inferior by employers, and

difficulties are encountered by its participants when re-entering into the formal system. Often non-formal training is leading to a dead end in the employment structure. That's why there should be a wider system of educational provisions, in which formal and non-formal education will no longer be separate units.

In the FRG it is regretted that, despite the fact that over a 100.000 people are occupied in the alternative sector, trying to give work and production another content by organizing recycling-projects etc, a broadly set-up, nation-wide promotion of initiatives for vocational education for this so-called 'second labour market' doesn't exist. These kind of sub-systems should co-operate with each other and with the wider economic infra-structure.

As stated earlier, adult education mechanisms are more open and flexible than the formal education system. Many studies emphasize the importance of this flexibility. A flexible structure for adult education is considered essential in order to be able to:

- respond quickly to technical change
- meet changing demands for qualifications
- react to economic development
- take into account the needs of the students and the community.

For this reason in many countries decentralized organization exists in the field of adult education. Autonomy and freedom in operation at a local level make sudden initiatives possible. Often the initiatives developed at local level

lead to dynamic changes. Regional control in the decision-making process is also considered important, because training is more effective when it is adjusted to situations within the regional context.

The demand for local autonomy can also come from minority groups, like the Maori in New Zealand, who want control over their own educational systems. A decentralized organization might as well facilitate the creation of educational programmes for migrants and refugees.

In Denmark we can find an example of decentralization. The 'Folkeligt Oplysnings Forbund', a private popular education organization, works with an 'open budget'. This has the advantage that retraining can start immediately in response to local employment market changes, without wasting time with central authorities. The formal system is much slower, due to the decision-making process and allocation of resources. Starting from the Danish principle that all subjects are to be treated equally, the organization supports people at local level, who feel that a certain subject or problem is important in this local region. In that case, there will be no discussion at federal level on whether this subject is worthy or not of the sponsorship of the national authorities.

In the actual economic systems, this attention for the needs of local groups does not always improve their chances on the labour market. Employers usually prefer diplomas approved by the authorities to practical experience.

For this reason sometimes programmes that are part of an overall plan of education and training and that lead to recognized qualifications at the end have priority.

In Scotland an intermediate solution has been found. The necessity of a national certificate and the need for flexibility are combined in a 'modular system'. A series of free-standing units of study, known as modules, replace all existing non-advanced further education courses. These modules can be certificated on an individual basis or combined into coherent programmes of study designed to meet the needs of students and employers.

The modular system, known as the National Certificate, became operational in 1984. In december 1986 there were already over 80.000 students, working with over 2.100 modules, covering the whole range of vocational activities: engineering, construction, the sciences, business studies, food, land and sea-based studies and the entire range of personal and social education. The attainments of a student who achieves a module or a whole series of modules, are recognized and certificated. Modules can be started at any time to suit the student and the teaching institution. Students can study full time, part-time, in the daytime, evening or through a variety of open learning systems. They can study in schools, colleges, community education centres, outdoor centres and training workshops. They may be employed or unemployed.

The National Certificate also allows flexibility in

curriculum design. Next to the modules devised centrally to fulfil national needs, room is left for 'locally devised modules'. Interested local groups or individuals can submit a module for approval and, if it is recognized as being of sufficient quality, it will be entered into the National Catalogue. The small unit size of a module means that any existing module can, with ease, be updated, amended or discarded to cope with changing technology and the needs of a rapid changing society.

Some countries offer courses that are concluded with a national examination in order to guarantee the quality of the courses and to facilitate the integration of the courses in the educational system. In France, training programmes recognized by the National Education System can lead to the acquisition of a certificate in vocational studies. In the FRG, 5% of the occupationally oriented courses offer the possibility of taking a national examination. In the Republic of Korea, since 1976 a formal system has been established in order to control the quality of the training programmes and of those who have completed the training: the National Technical Certification System. Since 1983, certified persons are required to undergo a retraining every 5 years. If they don't undergo the retraining, their certificates are no longer valid.

In socialist countries centralized educational systems predominate. Adult education is often an integral part of the unified system of public education. The system of skill

upgrading is usually executed on a plan basis. In the Soviet Union for example, the planning of vocational training of workers is in accordance with the 5-year plan of economic and social development. Generally the state determinates the content of adult education and the conditions of certification.

FUTURE NEEDS

At the International Consultative Meeting of Experts on Improving Continuing Education of Workers, held in Liblice near Prague from May 18-22, 1987, Ivan Savický, staff member of the European Centre for Leisure and Education, described the period in which we are living as a period of transition.

He considers the education of workers as a phenomenon of transition from pre-capitalist society - static and to a considerable degree closed, on the whole not needing a special goal-oriented educational system - to capitalist society with its incomparably greater individual mobility on the one hand, and rapid changes in the entire way of life on the other. In this period of transition it was convenient to have two relatively independent educational subsystems: one concerned with basic knowledge, skills and habits, permitting integration in modern society, the other concerned with adaptation to specific roles.

It is more difficult to define the present period of transition. Some people say we move from industrial to post-industrial society, from a society of large-scale production to a society of services. Others say capitalist society will make way for post-capitalist society, or capitalist society for communist society.

The present day transition has again its consequences for the educational system. The actual system often fails to

such an extent that many people talk about a general 'crisis of education'. In the present conditions the necessity is felt to pass from the two-stage education system to a system of lifelong education.

In fact, the enormous proportions adult education has assumed recently represent already a step towards this permanent of lifelong education. This development proves that youth education is no longer sufficient for people's educational needs.

The idea of lifelong education has taken more definite shape in the projects of socialist countries. As we have seen, adult education in these countries is an integral part of the educational system, that has to ensure a lifelong education covering all the fields: politics, science, technology and culture. Socialist residents are expected to improve themselves all the time, in their profession and in their personal and social life.

In other countries as well the search for possibilities to alternate periods of education and work, for alternative forms of combining learning and working, shows that a trend exists to diffuse education over more periods of the life of a human being.

This development towards a permanent education can only be a positive one if other factors will also change. If unemployment will remain one of the serious problems in the world and education will stay aimed at work, lifelong learning might become a lifelong fear of losing competence, and

large groups of the society will be excluded from the educational provisions. The new educational system has to be combined with new ways of living.

According to the experts however, the transition to a new system of education, based on a new philosophy, can not be realistically envisaged earlier than in two or three decades, and moreover only in countries which have the most favourable conditions, mainly great economic and cultural potentials. So, for the time being, we will have to confine ourselves to aim at an optimal efficacy of the existing systems.

The tendency to create supra-national economic units, like the Comecon, the EEC, and neo-colonialist forms of economic expansion, can not be neglected in the field of adult education. The large supra-national or national companies in capitalist society and associations in socialist society mostly have more clearly structured aims than the national economy in small and medium-sized countries. They will make adult education systems concurrent with the national ones.

Because of their international experiences and economic power, these companies and associations are able to make qualitative and quantitative strong programmes. The question is if much room will be left for local needs as well as for personal and cultural needs of the participants. Definitely they will restrict their training to those in employment or those who are expected to be employed.

The adult teachers that promote the interests of marginal

groups emphasize the importance of supporting forms of education that can have the confidence of people who lost faith in all systems, also, and maybe especially, in the educational system.

In the world of today equal educational chances for all still don't exist. In order to improve the situation of the underprivileged, those who are active in the field of adult education are advised to start from local needs and local provisions. They should make use of the existing infrastructure and be vigilant that resources are used in the most effective way. The opportunity should be created for participants to be free from work on a temporary basis.

In New Zealand, it is found that the following barriers are hampering some groups of the society to take part in the educational system and to develop their talents:

- curriculum and a classroom climate that is racist or sexist
- academic entry requirements
- levels of financial support for students
- lack of support facilities such as childcare
- assessment procedures
- social and individual attitudes
- restriction on the number of places available for training

The participants, their needs and qualities, their social and cultural environment, should be the starting-point of the programmes. In many cases this demands a complete turn-over. Often in training programmes preparing people for changes due to the development of science and technology, there is a tendency to neglect social and human factors.

Sometimes educational forms from the past can contribute to the creation of new educational programmes. In ancient Sri Lanka, informal and non-formal modes of learning existed. Impartation of occupational skills, codes of behaviour and initiation into the value systems within which one could relate to the different members of the society and to the different situations encountered were important elements of education. Learning and working were interlinked closely. The most skilled in each occupational group set the standard and imparted the skills as a continuing process of non-formal education.

These traditional cultural values have inspired people in Sri Lanka to create the Sarvodaya Shramadana Movement. The movement was founded in 1958 and contributes to the education of approximately one million people. It operates in more than 5000 villages. The objectives of the Sarvodaya movement are:

- to awaken the masses of rural people to utilize their own development potentials through self-help and self-reliance and by concrete development action.
- to bring about a general recognition of the value of utilizing labour resources which the people volunteer to donate for national development
- to evolve leadership at grassroots level, inspired by the people's traditions and cultural values and to gain knowledge through participatory experiences in village development.

The problem of development is seen by the leaders of Sarvodaya, not so much in terms of production and distribution of goods and services and building up the institutional structures for that purpose, as in terms of an awakening inate goodness in the heart of man and returning to traditional values and codes of conduct.

The different project experiments that we have mentioned in this paper represent another effort to include the whole human being in the educational process.

Some of the studies express the wish to come to a philosophy of education. This philosophy should be based on the awareness of the common destiny of mankind and on a broader outlook on the world and life as a whole.

Adult education in its function of preparing people for the changes in science and technology, changes that will transform life on our planet, is expected to play an increasing part. Because of this function, adult education has a key position in the development of such a philosophy and would thereby have the possibility to contribute to the creation of a more human society.

The movement in Sri Lanka and the project experiments form a first step in this process.

CONCLUSION

The comparison of the fourteen case-studies has shown that educational provisions in the context of scientific and technological development are extremely rich in diversity. They can fulfil many different functions, are set up for various target-groups and assume all kind of forms.

Notwithstanding this diversity, one tendency can be distinguished: adult education is becoming increasingly important and no longer represents a second chance-education for adults, a copy of the educational system for youth, but is forming a new, unique system of education.

More and more adults will be involved in a form of adult education in order to be able to keep up with the radical changes. For this reason adult education will play a decisive role in the way science and technology will affect our life: on the one hand it can reduce the human being to an appendage of a machine, a small screw in a bureaucratic system, on the other hand it can prepare people to use science and technology for the improvement of the conditions of humanity and the quality of life on our planet.

Because adult education is manysided and not yet hampered by fixed structures, it offers the opportunity to give education and work a new meaning.